



Appl. No. 09/974,973
Amdt. Dated August 22, 2003
Reply to Office Action of April 22, 2003
Replacement Sheet

GTGACTGCTATCACCCCTGGCGGTCTTGTTGAAAGGAATAATTACTCTAGTGTGACT

1+.....+.....+.....+.....+.....+.....+ 60

M T A I T L G G L L L K G I I T L V S T

CACACATCTTCAACGCTTCCAGCATTCAAAAAGATCTTGGTAGCAAACCGCGCGAAATC

61+.....+.....+.....+.....+.....+.....+ 120

H T S S T L P A F K K I L V A N R G E I

GCGGTCCGTGCTTCCGTGCAGCACTCGAAACCGGTGCAGCCACGGTAGCTATTTACCCC

121+.....+.....+.....+.....+.....+.....+ 180

A V R A F R A A L E T G A A T V A I Y P

CGTGAAGATCGGGGATCATTCCACCGCTCTTGCTTCTGAAGCTGTCCGCATTGGTACT

181+.....+.....+.....+.....+.....+.....+ 240

R E D R G S G H R S F A S E A V R I G T

GAAGGCTACCAAGTCAAGGCGTACCTGGACATCGATGAAATTATCGGTGCAGCTAAAAAA

241+.....+.....+.....+.....+.....+.....+ 300

E G S P V K A Y L D I D E I I G A A K K

GTTAAAGCAGATGCTATTACCCGGGATATGGCTTCTGTCTGAAAATGCCAGCTTGC

301+.....+.....+.....+.....+.....+.....+ 360

V K A D A I Y P G Y G F L S E N A Q L A

CGCGAGTGCAGGAAACGGCATTACTTTATTGGCCCAACCCAGAGGTTCTGATCTC

361+.....+.....+.....+.....+.....+.....+ 420

R E C A E N G I T F I G P T P E V L D L

ACCGGTATAAGTCTCGTGCCTAACCGCCGCGAAGAAGGCTGGTCTGCCAGTTGGCG

421+.....+.....+.....+.....+.....+.....+ 480

T G D K S R A V T A A K K A G L P V L A

GAATCCACCCCGAGCAAAACATCGATGACATCGTAAAGCGCTGAAGGCCAGACTTAC

481+.....+.....+.....+.....+.....+.....+ 540

E S T P S K N I D D I V K S A E G Q T Y

FIG.1A



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CCCATTTGAAAGGAGTTGCCGGTGGCGGACGCGGTATGCCTTGTTC

541 - - - - + - - - + - - - + - - - + - - - + - - - + 600

P I F V K A V A G G G G R G M R F V S S

CCTGATGAGCTCCGCAAATTGGAACAGAACGATCTCGTGAAGCTGAAGCGGCATTGGC

601 - - - - + - - - + - - - + - - - + - - - + - - - + 660

P D E L R K L A T E A S R E A E A A F G

GACGGTTCGGTATATGTCGAACGTGCTGTGATTAACCCCCAGCACATTGAAGTGCAGATC

661 - - - - + - - - - + - - - - + - - - - + - - - - + - - - - + 720

D G S V Y V E R A V I N P Q H I E V Q I

CTTGGCGATCGCACTGGAGAAGTTGACACCTTATGAACGTGACTGCTACTGCAGCGT

721 - - - - + - - - + - - - + - - - + - - - + - - - + - - - + 780

L G D R T G E V V H L Y E R D C S L Q R

CGTCACCAAAAGTTGTCGAAATTGCGCCAGCACAGCATTGGATCCAGAACTGCGTGAT

781 -----+-----+-----+-----+-----+-----+-----+ 840

R H Q K V V E I A P A Q H L D P E L R D

CGCATTTGTGCGGATGCAGTAAAGTTCTGCCGCTCCATTGGTTACCAAGGGCGCGGGAAACC

841 -----+-----+-----+-----+-----+-----+-----+ 900

R I C A D A V K F C R S I G Y Q G A G T

GTGGAAATTCTTGGTCGATGAAAAGGGCAACCACGTTTATCGAAATGAACCCACGTATC

901 +-----+-----+-----+-----+-----+-----+ 960

V E F L V D E K G N H V F I E M N P R I

CAGGGT GAGCACACCGT GACTGAAGAAGTCACCGAGGTGGACCTGGTGAAGGCGCAGATG

961 +-----+-----+-----+-----+-----+-----+-----+ 1020

Q V E H T V T E E V T E V D L V K A Q M

CGCTTGGCTGGTGCAACCTGAAGGAATTGGGTCTGACCCAAGATAAGATCAAGACCG

1021 - - - - + - - - - + - - - - + - - - - + - - - - + - - - - + 1080

R L A A G A T L K E L G L T Q D K I K T

FIG. 1B



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CACGGTGCAGCACTGCAGTGCCTGCATCACCAACGGAAAGATCCAAACAAACGGCTTCCGCCA

1081+.....+.....+.....+.....+.....+ 1140

H G A A L Q C R I T T E D P N N N G F R P

GATACCGGAACTATCACCGCGTACCGCTCACCAAGGCGGAGCTGGCGTTCGTCTTGACGGT

1141+.....+.....+.....+.....+.....+ 1200

D T G T I T A Y R S P G G A G V R L D G

GCAGCTCAGCTCGGTGGCGAAATCACCGCACACTTGACTCCATGCTGGTAAAATGACC

1201+.....+.....+.....+.....+.....+ 1260

A A Q L G G E I T A H F D S M L V K M T

TGCCGTGGTCCGACTTTGAAACTGCTGTTGCTCGTGCACAGCGCGCGTGGCTGAGTTC

1261+.....+.....+.....+.....+.....+ 1320

C R G S D F E T A V A R A Q R A L A E F

ACCGTGTCTGGTGGTCAACCAACATTGGTTCTTGCCTGGCTGCTGCGGGAAAGAGGAC

1321+.....+.....+.....+.....+.....+ 1380

T V S G V A T N I G F L R A L L R E E D

TTCACTTCCAAGCGCATGCCACCGGATTTATCGGGCATCACCCACACCTCCTTCAGGCT

1381+.....+.....+.....+.....+.....+ 1440

F T S K R I A T G F I G D H P H L L Q A

CCACCTGCGGATGATGAGCAGGGACGCATCCTGGATTACTTGGCAGATGTCACCGTGAAC

1441+.....+.....+.....+.....+.....+ 1500

P P A D D E Q G R I L D Y L A D V T V N

AAGCCTCATGGTGTGCGTCAAAGGATGTTGCAGCACCAATGATAAGCTGCCAACATC

1501+.....+.....+.....+.....+.....+ 1560

K P H G V R P K D V A A P I D K L P N I

AAGGATCTGCCACTGCCACGCGGTTCCCGTGACCGCCTGAAGCAGCTTGGCCCAGCCGCG

1561+.....+.....+.....+.....+.....+ 1620

K D L P L P R G S R D R L K Q L G P A A

FIG.1C



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TTTGCTCGTGATCTCCGTGAGCAGGACGCCTGGCAGTTACTGATACCACTCCGCGAT

1621 -----+-----+-----+-----+-----+-----+ 1680

F A R D L R E Q D A L A V T D T T F R D

GCACACCAGTCTTGCTTGCACCGAGTCCGCTCATTGCACTGAAGCCTGCGGCAGAG

1681 -----+-----+-----+-----+-----+-----+ 1740

A H Q S L L A T R V R S F A L K P A A E

GCCGTCGCAAAGCTGACTCCTGAGCTTTGTCCGTGGAGGCCTGGGGCGCGACCTAC

1741 -----+-----+-----+-----+-----+-----+ 1800

A V A K L T P E L L S V E A W G G A T Y

GATGTGGCGATGCGTTCCCTTTGAGGATCCGTGGGACAGGCTCGACGAGCTGCGCGAG

1801 -----+-----+-----+-----+-----+-----+ 1860

D V A M R F L F E D P W D R L D E L R E

GCGATGCCGAATGTAAACATTCAAGATGCTGCTCGCGGCCGAAACACCGTGGATAACACC

1861 -----+-----+-----+-----+-----+-----+ 1920

A M P N V N I Q M L L R G R N T V G Y T

CCGTACCCAGACTCCGCTGCCGCGCTTGTAAAGGAAGCTGCCAGCTCCGGCGTGGAC

1921 -----+-----+-----+-----+-----+-----+ 1980

P Y P D S V C R A F V K E A A S S G V D

ATCTTCCGCATCTCGACGCGCTTAACGACGTCTCCAGATGCGTCCAGCAATCGACGCA

1981 -----+-----+-----+-----+-----+-----+ 2040

I F R I F D A L N D V S Q M R P A I D A

GTCCTGGAGACCAACACCGCGGTAGCCGAGGTGGCTATGGCTTATTCTGGTATCTCT

2041 -----+-----+-----+-----+-----+-----+ 2100

V L E T N T A V A E V A M A Y S G D L S

GATCCAAATGAAAAGCTCTACACCCCTGGATTACTACCTAAAGATGGCAGAGGAGATCGTC

2101 -----+-----+-----+-----+-----+-----+ 2160

D P N E K L Y T L D Y Y L K M A E E I V

FIG.1D



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AAGTCTGGCGCTCACATTCTGGCCATTAAGGATATGGCTGGTCTGCTTCGCCAGCTGCG
2161+.....+.....+.....+.....+.....+ 2220

K S G A H I L A I K D M A G L L R P A A

GTAACCAAGCTGGTCACCGCACTGCGCCGTGAATTGATCTGCCAGTGCACGTGCACACC
2221+.....+.....+.....+.....+.....+ 2280

V T K L V T A L R R E F D L P V H V H T

CACGACACTGCGGGTGGCCAGTTGGCTACCTACTTGCTGCAGCTAAGCTGGTGCAGAT
2281+.....+.....+.....+.....+.....+ 2340

H D T A G G Q L A T Y F A A A Q A G A D

GCTGTTGACGGTGCTTCCGCACCACTGTCTGGCACCACCTCCCAGCCATCCCTGTCTGCC
2341+.....+.....+.....+.....+.....+ 2400

A V D G A S A P L S G T T S Q P S L S A

ATTGTTGCTGCATTGCGCACACCCGTCGCGATACCGGTTGAGCCTCGAGGCTGTTCT
2401+.....+.....+.....+.....+.....+ 2460

I V A A F A H T R R D T G L S L E A V S

GACCTCGAGCCGTACTGGGAAGCTGTGCGCGACTGTACCTGCCATTGAGTCTGGAACC
2461+.....+.....+.....+.....+.....+ 2520

D L E P Y W E A V R G L Y L P F E S G T

CCAGGCCAACCGGTCGCGTCTACCGCCACGAAATCCAGGCGGACAGTTGTCCAACCTG
2521+.....+.....+.....+.....+.....+ 2580

P G P T G R V Y R H E I P G G Q L S N L

CGTGCACAGGCCACCGCACTGGGCCTTGCTGATCGCTTCGAGCTCATCGAAGACAACACTAC
2581+.....+.....+.....+.....+.....+ 2640

R A Q A T A L G L A D R F E L I E D N Y

GCAGCCGTTAATGAGATGCTGGGACGCCAACCAAGGTCAACCCATCCTCCAAGGTTGTT
2641+.....+.....+.....+.....+.....+ 2700

A A V N E M L G R P T K V T P S S K V V

FIG.1E



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GGCGACCTCGCACTCCACCTGGTTGGTAGATCCAGCAGACTTGCTGCAGAC

2701+.....+.....+.....+.....+.....+ 2760

G D L A L H L V G A G V D P A D F A A D

CCACAAAAGTACGACATCCCAGACTCTGTATCGCGTCTGCAGCGAGCTTGGTAAC

2761+.....+.....+.....+.....+.....+ 2820

P Q K Y D I P D S V I A F L R G E L G N

CCTCCAGGTGGCTGGCCAGAACCACTGCGACCCGCGCACTGGAAGGCCGCTCCGAAGGC

2821+.....+.....+.....+.....+.....+ 2880

P P G G W P E P L R T R A L E G R S E G

AAGGCACCTCTGACGGAAGTTCTGAGGAAGAGCAGGCGCACCTCGACGCTGATGATTCC

2881+.....+.....+.....+.....+.....+ 2940

K A P L T E V P E E E A A H L D A D D S

AAGGAACGTCGCAACAGCCTCAACCGCCTGCTGTTCCGAAGCCAACCGAAGAGTTCTC

2941+.....+.....+.....+.....+.....+ 3000

K E R R N S L N R L L F P K P T E E F L

GAGCACCGTCGCCGCTTCGGCAACACCTCTGCGCTGGATGATCGTGAATTCTCTACGGA

3001+.....+.....+.....+.....+.....+ 3060

E H R R R F G N T S A L D D R E F F Y G

CTGGTCGAGGGCCGCGAGACTTTGATCCGCTGCCAGATGTGCGCACCCACTGCTTGT

3061+.....+.....+.....+.....+.....+ 3120

L V E G R E T L I R L P K V R T P L L V

CGCCTGGATGCGATCTCTGAGCCAGACGATAAGGGTATGCGCAATGTTGTGCCAACGTC

3121+.....+.....+.....+.....+.....+ 3180

R L D A I S E P D D K G M R N V V A N V

AACGGCCAGATCCGCCAATGCGTGTGCGTACCGCTCCGTTGAGTCTGTACCGCAACC

3181+.....+.....+.....+.....+.....+ 3240

N G Q I R P M R V R D R S V E S V T A T

FIG. 1F



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GCAGAAAAGGCAGATT CCTCCAACAAGGGCCATGTTGCTGCACCATTGCTGGTGTGTC

3241 -----+-----+-----+-----+-----+-----+ 3300

A E K A D S S N K G H V A A P F A G V V

ACTGTGACTGTTGCTGAAGGTGATGAGGTCAAGGCTGGAGATGCAGTCGCAATCATCGAG

3301 -----+-----+-----+-----+-----+-----+ 3360

T V T V A E G D E V K A G D A V A I I E

GCTATGAAGATGGAAGCAACAATCACTGCTTCTGTTGACGGCAAGATTGAAACCGCGTTGTG

3361 -----+-----+-----+-----+-----+-----+ 3300

A M K M E A T I T A S V D G K I E R V V
GTTCCCTGCTGCAACGAAGGTGGAAGGTGGCGACTTGATCGTCGTCGTTCTAA

3421 -----+-----+-----+-----+-----+-----+ 3474

V P A A T K V E G G D L I V V V S *

FIG.1G



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1 50
ATCC 21253 pyc MST HTSSTLPAFK KILVANRGEI AVRAFRAALE
NRRL B-11474 pyc MTAITLGGLL LKGIITLV

51 100
ATCC 21253 pyc TGAATVAIYP REDRGSFHRS FASEAVRIGHT EGSPVKAYLD IDEIIGAAKK
NRRL B-11474 pyc

101 150
ATCC 21253 pyc VKADAIYPGY GFLSENAQLA RECAENGITF IGPTPEVLDL TGDKSRVTA
NRRL B-11474 pyc

151 200
ATCC 21253 psy AKKAGLPVLA ESTPSKNIDE IVKSAEGQTY PIFVKAVAGG GGRGMRFVAS
NRRL B-11474 pyc D S

201 250
ATCC 21253 psy PDELRKIMATE ASREAEAAFG DGAVYVERAV INPQHIEVQI LGDHTGEVVH
NRRL B-11474 pyc S R

251 300
ATCC 21253 psy LYERDCSLQR RHQKVVEIAP AQHLDPELRD RICADAVKFC RSIGYQGAGT
NRRL B-11474 pyc

301 350
ATCC 21253 psy VEFLVDEKGN HVFIEMNPRI QVEHTVTEEV TEVDLVKAQM RLAAGATLKE
NRRL B-11474 pyc

351 400
ATCC 21253 psy LGLTQDKIKT HGAALQCRIT TEDPNNGFRP DTGTITAYRS PGGAGVRLDG
NRRL B-11474 pyc

401 450
ATCC 21253 psy AAQLGGEITA HFDSMLVKMT CRGSDFETAV ARAQRALAEF TVSGVATNIG
NRRL B-11474 pyc

451 500
ATCC 21253 psy FLRALLREED FTSKRIATGF IADHPHLLQA PPADDEQGRI LDYLADVTN
NRRL B-11474 pyc G

501 550
ATCC 21253 psy KPHGVRPKDV AAPIDKLPNI KDLPLPRGSR DRLKQLGPAA FARDLREQDA
NRRL B-11474 pyc

FIG.2A



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ATCC 21253 psy
NRRL B-11474 pyc

551 600
LAVTDTTFRD AHQSLLATRV RSFALKPAAE AVAKLPELL SVEAWGGATY

601 650
DVAMRFLFED PWDRLDLRE AMPNVNIQML LRGRNTVGYT PYPDSCRAF

651 700
VKEAASSGVD IFRIFDALND VSQMRPAIDA VLETNTAVAE VAMAYSGDLS

701 750
DPNEKLYTLD YYLKMAEEIV KSGAHILAIK DMAGLLRPAA VTKLVTALRR

751 800
EFDLPPVHVHT HDTAGGQLAT YFAAAQAGAD AVDGASAPLS GTTSQPSLSA

801 850
IVAAFAHTRR DTGLSLEAVS DLEPYWEAVR GLYLPFESGT PGPTGRVYRH

851 900
EIPGGQLSNL RAQATALGLA DRFELIEDNY AAVNEMLGRP TKVTPSSKVV

901 950
GDLALHLVGA GVDPADFAAD PQKYDIPDSV IAFLRGELGN PPGGWPEPLR

951 1000
TRALEGRSEG KAPLTEVPEE EQAHLDADDS KERRNSLNRL LFPKPTEEFL

1001 1050
EHRRRFGNTS ALDDREFFYG LVEGRETLIR LPDVRTPLLV RLDAISEPDD

1051 1100
KGMRNVVANV NGQIRPMRVR DRSVESVTAT AEKADSSNKG HVAAPFAGVV

FIG.2B



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ATCC 21253 psy
NRRL B-11474 pyc

ATCC 21253 psy
NRRL B-11474 pyc

1101 1150
TVTVAEGDEV KAGDAVAlIE AMKMEATITA SVDGKIDRVV VPAATKVEGG
E

1151 1200
DLIVVVS

FIG.2C



EFFECT OF VARIOUS SUBSTRATE CONCENTRATIONS ON PYRUVATE CARBOXYLASE ACTIVITY FROM *C. glutamicum* BF100 (○) AND ATCC 21253 (●).

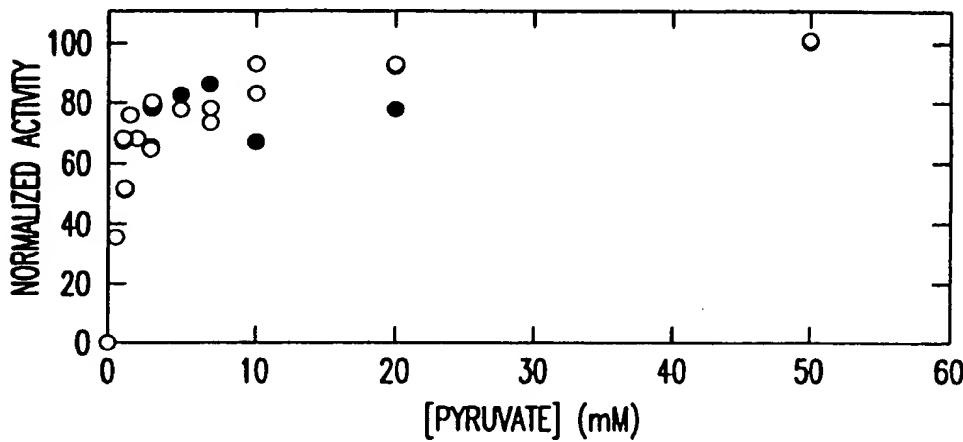


FIG. 3A

EFFECT OF VARIOUS SUBSTRATE CONCENTRATIONS ON PYRUVATE CARBOXYLASE ACTIVITY FROM *C. glutamicum* BF100 (○) AND ATCC 21253 (●).

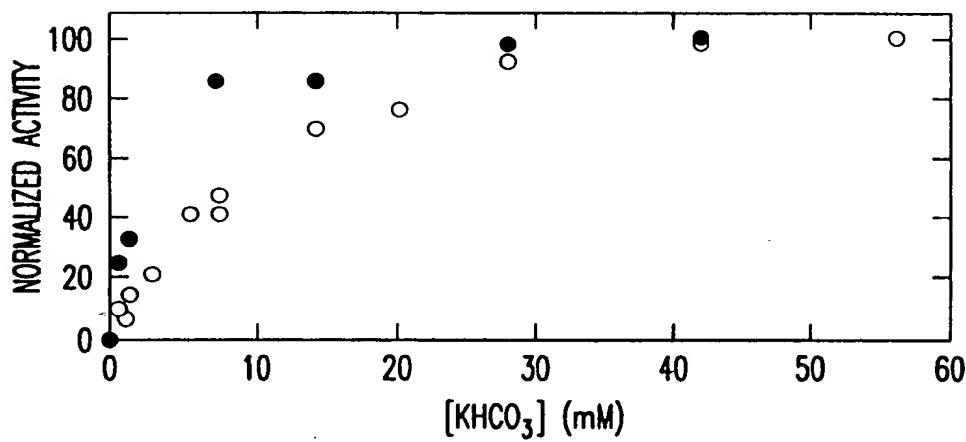


FIG. 3B

EFFECT OF VARIOUS SUBSTRATE CONCENTRATIONS ON PYRUVATE CARBOXYLASE ACTIVITY FROM *C. glutamicum* BF100 (○) AND ATCC 21253 (●).

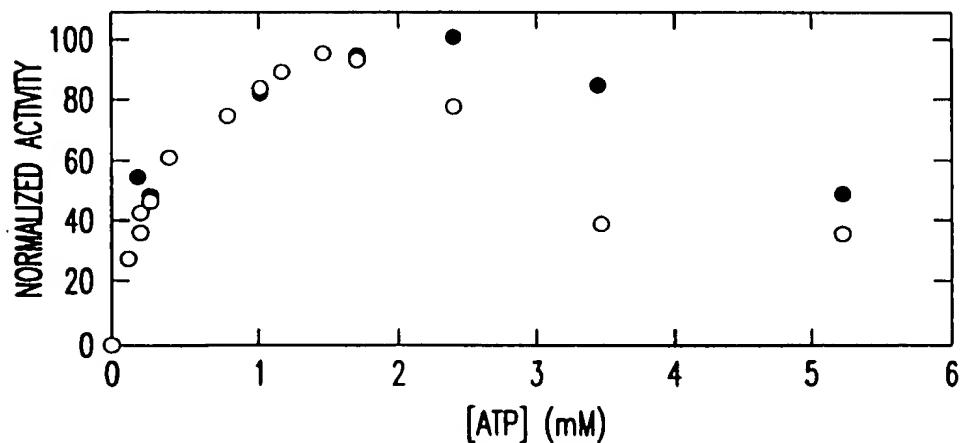


FIG. 3C



EFFECT OF ASPARTATE ON THE ACTIVITY OF PYRUVATE CARBOXYLASE
FROM *C. glutamicum* BF100 (○) AND ATCC 21253 (●).

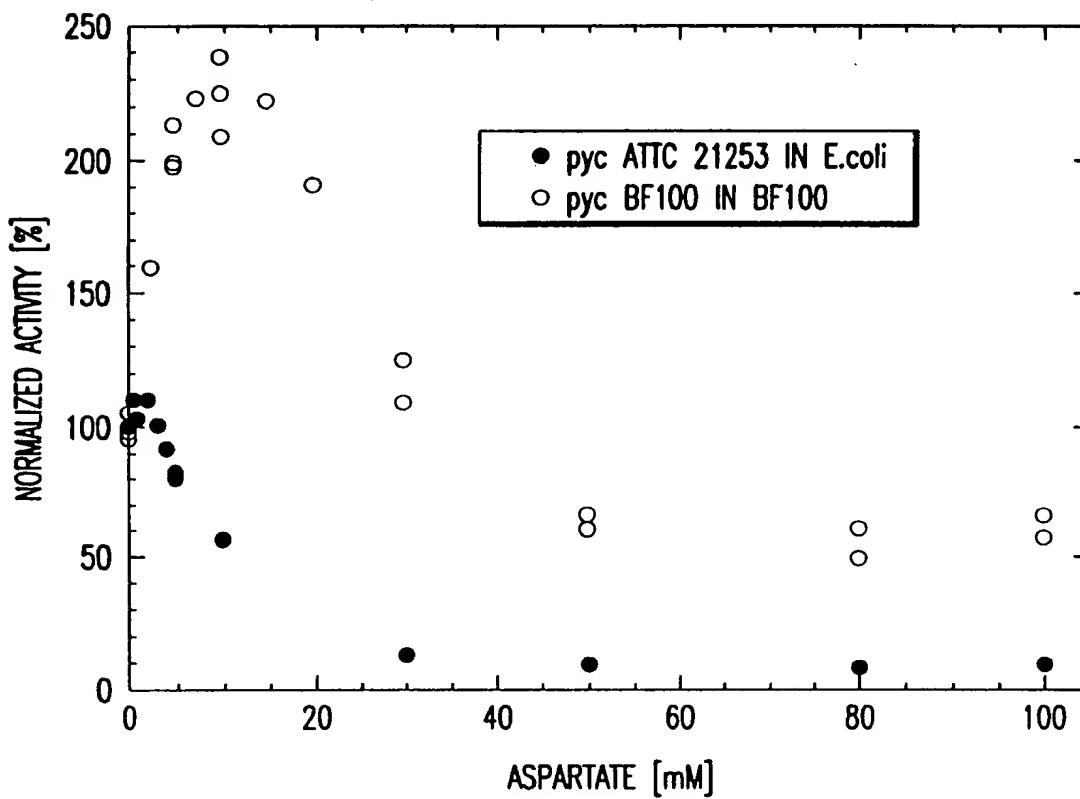


FIG. 4



EFFECT OF ACETYL-CoA ON PYRUVATE CARBOXYLASE ACTIVITY FROM
C. glutamicum BF100 (○) AND ATCC 21253 (●).

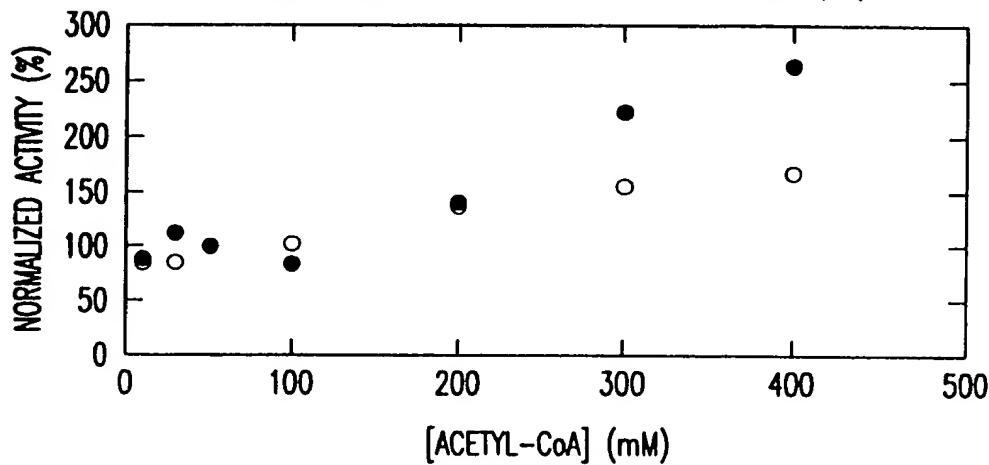


FIG. 5

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Annotated Sheet Showing Changes



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ATCC 21253 psy
NRRL B-11474 pyc

ATCC 21253 psy
NRRL B-11474 pyc

1101 1150
TVTVAEGDEV KAGDAVAlIE AMKMEATITA SVDGKIDRVV VPAATKVEGG
X E

1151 1200
DLIVVVS

FIG.2C



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GTGACTGCTATCACCTGGCGGTCTTGGAAAGGAATAATTACTCTAGTGTGACTCACACATCTT
AACGCTCCAGCATTCAAAAGATCTTGGTAGCAAACCGCGCGAAATCGCGTCCGTGCTTCCGTGAG
CACTCGAAACCGGTGAGCCACGGTAGCTATTACCCCGTGAAGATCGGGATCATCCACCGCTCTT
GCTTCTGAAGCTGTCCGATTGGTAGCTAAGGCTCACAGTCAAGCGTACCTGGACATCGATGAAATTAT
CGGTGAGCTAAAAAGTTAAAGCAGATGCTATTACCCGGATATGGCTCTGTGAAATGAG
TTGCCCGAGTGCAGGAAAACGGCATTACTTTATTGGCCAACCCAGAGGTTCTGATCTCACCGT
GATAAGCTCGTGCAGGTAACCGCCCGAAGAAGGCTGGCTGCCAGTTGGCGGAATCCACCCCGAG
AAACATCGATGACATCGTAAAGCGCTGAAGGCCAGACTTACCCATCTTGTAAGGCGAGTGC
GTGGCGGACGGTAGCGCTTGTCTTACCTGATGAGCTCCGCAAATTGGCAACAGAAGCATCTCG
GAAGCTGAAGCGGCACTGGCGACGGTTCGGTATATGCGAACGTGCTGTGATTAACCCAGCACATTG
AGTGCAGATCCTGGCGATCGCACTGGAGAAGTTGACACCTTATGAAACGTACTGCTACTGCAGCGTC
GTCACCAAAAGTTGTCGAAATTGCGCCAGCACAGCATTGGATCCAGAACTGCGTGAATCGCATTGCG
GATGAGCTAAAGTTCTGCCGCTCATTGGTACCAAGGGCGCGGGAACCGTGGAAATTCTGGTCGATGAAA
GGGCAACCACGTTTATCGAAATGAACCCACGTATCCAGGTTGAGCACCCGTGACTGAAGAAGTCACCG
AGGTGGACCTGGTGAAGGCGCAGATGCGCTTGGCTGCTGGTCAACCTTGAAGGAATTGGCTGACCCAA
GATAAGATCAAGACCCACGGTGAGCACTGCACTGCCATCACACGGGAAGATCCAACACGGCTTCCG
CCAGATACCGGAACTATCACCGCGTACCGCTCACCAAGGGAGCTGGCTTGGTCAACCGTGGTCCGACTT
AGCTCGGTGGCAGAACCTACCGCACAATTGACTCCATGCTGGTAAAAATGACCTGGCTGGTCCGACTT
GAAACTGCTTGTGCTGACAGCGCGTGGCTGAGTTACCGTGTGGTGGTCAACCAACATTGG
TTCTTGCGTGCCTGCTGCCAGGGAAAGAGGACTTCACTTCAAGCGATGCCACCGGATTATCGCGATC
ACCCACACCTCCTCAGGCTCCACCTCGGGATGATGAGCAGGGACGATCTGGATTACTTGGCAGATGTC
ACCGTGAACAAGCCTCATGGTGTGCGTCCAAAGGATGTTGCGACCAATGATAAGCTGCCAACATCAA
GGATCTGCCACTGCCACCGGTTCCGTGACCGCTGAAGCAGCTGGCCAGCCGCTTGGTCAACCGT
TCCGTGAGCAGGACGCACTGGCAGTTACTGATACCACCTCCGGATGACCAACAGTCTTGCTTGC
CGAGTCCGCTCATTGCACTGAAGCCTGCCAGAGGCCGTCGCAAAGCTGACTCTGAGCTTGTCCG
GGAGGCGCTGGGCGGCCGACCTACGATGTGGCAGTGCCTTCTTGGAGGATCCGTGGGACAGGCTG
ACGAGCTGCCGAGGGATGCCGAATGTAACATTGAGTGTCTTCCGGCCGCAACACCGTGGGATAC
ACCCCGTACCCAGACTCCGCTGCCCGCTTGTAAAGGAAGCTGCCAGCTCCGGCTGGACATCTCCG
CATCTTGACCGCCTTAACGACGTCTCCAGATGCGTCCAGCAATGACGCACTGCTGGAGACCAACACCG
CGTAGCCAGGTGGCTATGGTTATTCTGGTATCTCTGATCCAATGAAAAGCTCTACACCGTGGAT
TACTACCTAAAGATGGCAGAGGAGATGTCAGTCTGGCCTCACATTGGCATTAGGATATGGCTGG
TCTGCTTCCGAGCTGCCAGTGCAGTACCAAGCTGGTACCCGACTGCCGCTGAATTGATCTGCCAGTGC
TGCACACCCACGACACTGCCGGTGGCCAGTTGGTACCTACTTTGCTGCAAGCTCAAGCTGGTCAAGT
GTTGACGGTGCCTCCGACCACGTCTGGCACCACCTCCAGCCATCCCTGCTGCCATTGTTGCTGCATT
CGCGCACACCGTGCAGTACCGGTTGAGCCTCGAGGCTGTTCTGACCTCGAGCGTACTGGAGCTG
TGCAGGACTGTACCTGCCATTGGAGTCTGGACCCAGGCCAACCGTGCCTGAGCTGCTGCCACGAAATC
CCAGGCGGACAGTTGCTCAACCTGCGTGCAGGCCACCGCACTGGCCCTGCTGATCGCTTGAGCTCAT
CGAAGACAACGACCGTTAATGAGATGCTGGAGGCCAACAGGTCACCCATCCTCAAAGGTTG
TTGGCGACCTCGCACTCCACCTGGTGGTGCAGGAGCTTGTAAACCTCCAGGTGGCTGGCAGA
TACGACATCCCAGACTCTGTCATCGCTTCTGCCGGCGAGCTTGTAAACCTCCAGGTGGCTGGCAGA
ACCACTGCGCACCCGCGACTGGAGGCCCTCGAAGGCAAGGACCTCTGACGGAGTTCTGAGG
AGCAGGCGCACCTCGACGCTGATGATTCAAGGAAGCTGCAACAGCCTCAACCGCTGCTGTTCCGAG
CCAACCGAAGAGTTCTGAGCACCGTCCGCTTGGCAACACCTCTGCGCTGGATGATCGTGAATTCTT
CTACGGACTGGTGCAGGGCCGCGAGACTTGTATCCGCTGCCAGATGTGCGCACCCACTGCTTGT
TGGATGCGATCTGAGGCCAGACGATAAGGGTATGCCAATGTTGGCCACCGTCAACGGCCAGATCCG
CCAATGCGTGTGCGTGCAGGCTCCGTTGAGTCTGTACCGCAACCGCAGAAAAGGCAAGATTCT
GGGCCATGTTGCTGCAACCATTGCTGGTGTCACTGTACTGTTGCTGAAGGTGATGAGGTCAAGGCTG
GAGATGCAATCGAGGCTATGAAGATGGAAGCAACAATACTGCTTGTGACGGCAAGGATT
GAACCGTTGTGGTCTGCTGCAACGAAGGTGGCACTTGATCGTGTGTTCTAA

FIG.3A

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MTAITLGGLLLKGIIITLVSTHTSSTLPAFKKILVANRGEIAVRAFRAALETGAATVAIYPREDRGSFHRSFASEAVRIG
TEGSPVKAYLDIDEIIGAAKKVKADAIYPGYGFLSENAQLARECAENGITFIGPTPEVLDLTGDKSRAVTAKKAGLPV
LAESTPSKNIDDIVKSAEGQTYPIFVKAVAGGGGRGMRFVSSPDELRKLATEASREAAFGDGSVYVERAVINPQHIE
VQILGDRTEVVHLYERDCSLQRRHQKVVEIAPAQHLDPELRDICADAVKFCRSIGYQGAGTVFLVDEKGNHVFIE
NPRIQVEHTVTEEVTEVDLVKAQMRLAAGATLKEGLTQDKIKTHGAALQCRITTEDPNNGFRPDTGTITAYRSPGGAG
VRLDGAAQLGGEITAHDMSMLVKMTCRGSDFETAVARAQRALAEFTVSGVATNIGFLRALLREEDFTSKRIATGFIGDH
PHLLQAPPADDEQGRILDYLADTVNKPHGVRPKDVAAPIDKLPNIKDLPLPRGSRDLKQLGPAAFARDLREQDALAV
TDTTFRDAHQSLLATRVSFALKPAAEAVAKLPELLSVEAWGGATYDVAMRFLFEDPWDRLDELREAMPVNQIQLLR
GRNTVGYTPYPDSVCRAFKEAASSGVDIFRIFDALNDVSQMRPAIDAVLETNTAVAEVAMAYSGDLSDPNEKLYTLDY
YLKMAEEIVKSGAHLAIKDMAGLLRPAAVTKLVTALRREFDLPVHVHTHTAGGQLATYFAAAQAGADAVDGASAPLS
GTTSQPSLSAIVAAFAHRRDTGLSLEAVSDLEPYWEAVRGLYLPFESGTPGPTGRVYRHEIPGGQLSNLRAQATALGL
ADRFELEDNYAAVNEMLGRPTKTPSSKVGDLALHVGAGVDPADFAADPQKYDIPDSVIAFLRGELGNPPGGWPEP
LRTRALEGRSEGKAPLTEVPEEEQAHLDADDSKERRNSLNRLFPKPTEEFLEHRRRGNTSADDREFFYGLVEGRET
LIRLPDVRTPLLVRLDAISEPDDKGMRNVANVNGQIRPMVRDRSVESVTATAEKADSSNKGHVAAPFAGVVTVTVAE
GDEVKAGDAVAIIEAMKMEATITASVDGKIERVVPAATKVEGGDLIVVVS

FIG.3B

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